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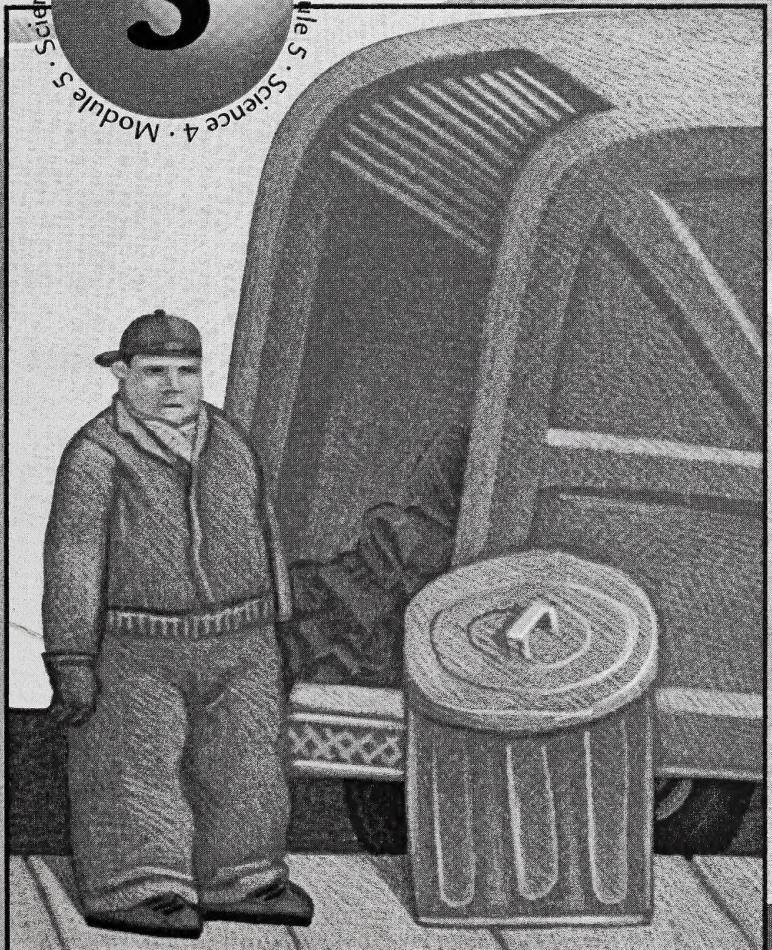
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Science 4

Waste and Our World
Home Instructor's Guide and
Assignment Booklet 5B

Module 5 · Science 4
Module 5 · Science 4
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Learning
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Branch

Science 4

Module 5: Waste and Our World

Home Instructor's Guide and Assignment Booklet 5B

Learning Technologies Branch

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The Learning Technologies Branch acknowledges with appreciation the Alberta Distance Learning Centre and Pembina Hills Regional Division No. 7 for their review of this Home Instructor's Guide and Assignment Booklet.

This document is intended for	
Students	✓
Teachers	✓
Administrators	
Home Instructors	✓
General Public	
Other	



You may find the following Internet sites useful:

- Alberta Education, <http://www.education.gov.ab.ca>
- Learning Technologies Branch, <http://www.education.gov.ab.ca/ltb>
- Learning Resources Centre, <http://www.lrc.education.gov.ab.ca>

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Module 5: Waste and Our World

Notes to the Home Instructor

This booklet contains the following components for you and your student:

1. Home Instructor's Guide

These are notes for you. First, there is an overview, a listing of suggested websites, and a listing of additional required materials needed for the section. Then, there is an overview of the content, activities, learning outcomes, and special requirements of each lesson in the section.

Note: To ensure that you have all of the materials on hand for your student to complete the activities for each module, read through the list of materials required for the lessons. They are boxed for easy reference, as shown in the following example.

Activity 5: Power of a Package

- pen or pencil
- paper or notepad

2. Assignment Record Form

This is a form to send in with the assignments. Remember to paste the address label provided by your school on it. The teacher will keep track of your student's assignments, record your student's grades, and include his or her comments using this form.

3. Assignment

Your student should answer all questions in complete sentences where possible. Questions set up as lists, tables, charts, or graphs do not need sentence answers. Send the assignment to the teacher as soon as the booklet has been completed.

4. Home Instructor Feedback Form and Student Feedback Form

You and your student should complete these forms. Send them in at the same time as the assignment. They provide us with helpful information about what we are doing right and what needs to be changed.

5. Checklist

The checklist helps you confirm that all of the required components have been collected prior to submitting the completed work to the teacher. For students completing this module electronically, this checklist also includes spaces to indicate the method of submitting graphs, drawings, or photos of assignment work where required.

Section 2: Pollution Solutions

Overview

This section introduces your student to the ways that we can help our environment. He or she will discover that some materials are biodegradable, recyclable, or reusable. Your student will evaluate his or her role in the production of waste, and he or she will explore how personal action in reducing, reusing, and recycling materials can help decrease total waste.

You may find the following websites helpful:

- the Recycling Council of Alberta
<http://www.recycle.ab.ca>
- the Composting Council of Canada
<http://www.compost.org>
- Environment Canada's Atlantic office (gives a comprehensive overview of recycling in Canada)
<http://www.atl.ec.gc.ca/pollution/general.html>
- detailed information on vermiculture (worm composting)
 - <http://www.napi.ca/vermaculture.htm>
 - <http://whatcom.wsu.edu/ag/compost/Redwormsedit.htm>

There are also many excellent print resources available. You may find *Looking at the Environment* by David Suzuki (Toronto: Stoddard, 1989) and *Keepers of the Earth* by Michael Caduto and Joseph Bruchac (Saskatoon: Fifth House, 1994) good places to start.

Assessment and Feedback

The feedback you and your student provide in the feedback forms will assist the teacher in assessing your student's progress.

The Section 2 Assignment is worth 77 marks out of a total 112 marks for this module.

Websites Mentioned in Module 5: Section 2

It is recommended that you check these websites prior to your student beginning work on this section.

Lesson 7

- Environment Canada
<http://www.atl.ec.gc.ca/publications.html>
- Environmental Protection Agency Welcome to Recycle City
<http://www.epa.gov/recyclecity>

Lesson 8

- The Adventures of Herman
<http://www.urbanext.uiuc.edu/worms/index.html>

Optional Follow-up Activities

Activity 4: Waste Management

- Edmonton's household waste system
<http://www.sortitout.ca/online.html>

Additional Required Materials

Activity 5: Power of a Package

- a pen or pencil
- paper or notepad

Activity 6: Making Wood from Paper

- a stack of old newspapers (Try to avoid coloured pages.)
- tape or cotton string

Activity 7: Making a Recycling Centre

- several cardboard boxes or other large containers
- a felt pen
- poster board (optional)

Activity 8: Making a Mini-Composter

- a large, empty (waxed paper) milk carton
- a pen or large knitting needle
- a bowl or pie plate
- a stirring stick or wooden spoon
- garden soil (not potting soil)
- yard waste (grass clippings, leaves, etc.)
- kitchen waste (fruit and vegetable scraps chopped very small, coffee grounds, and tea bags)

Activity 9: My Landfill

- rubber boots or other protective footwear
- a pen
- paper
- an adult's assistance

Activity 10: My Plan

- the students Personal Action Plan to Reduce Water Usage from Lesson 3 (question 3, Section 1 Assignment)

Optional Follow-up Activities

Activity 3: Masses of Packaging

- a bathroom scale

Final Test

If your student is completing all six modules, this reminder about a final test doesn't apply at this point.

If your student is required to write a final test, you will need to help him or her prepare. The final test will cover material from all modules your student studied. You should spend a few days of "Science time" reviewing what was covered in the course with your student. Make use of the Assignment Booklets and the comments and corrections that your student's teacher provided.

Make the review a chance to remember the major ideas developed in the lessons and the fun your student had doing the activities. Try to cover all of the important ideas, but don't try to cram too much into any given work period. The final test offers a chance for your student to show off all of the things that have been learned this year.

Lesson Summaries

Lesson 5: Reducing

Summary

In this lesson, your student will be introduced to the three Rs: reducing, reusing, and recycling. This lesson will focus on reducing. Your student will begin to see that there are many ways to reduce waste and its impact on air, water, and land. The lesson touches briefly on electricity. Electricity and energy are dealt with in depth in Grade 5 Science, so they are not explained in any great detail here. Electricity is generated by a variety of sources, including fossil fuels (coal, oil, natural gas), wind power, solar energy, nuclear energy, and flowing water (hydroelectric dams). The amount of electricity generated and, therefore, the amount of fossil fuels burned, is determined by demand. By limiting his or her use of electricity, your student will help the environment. This link may not be directly evident to your student, so you may need to explain it further. The focus of this section is not on electricity generation, but rather on ways of reducing the use of electricity, such as turning off lights and using power-saving bulbs.

While your student is looking at ways to reduce waste, you might check the Government of Alberta website. In particular, the page given has many ideas on conservation. Your student may be able to find ways to save energy and money for your family and at the same time reduce waste in the larger community.

<http://www.gov.ab.ca/home/index.cfm?page=1300>

The lesson also focuses on packaging, which makes up a large percentage of solid waste. Packaging is necessary with many items for health and safety reasons, but packaging is also advertising. Sometimes there is far too much packaging for the size of the item, or the packaging is simply unnecessary. Your student should begin to evaluate packaging. Activity 5 will focus on this. Your student will be asked to look at several different packages of a particular item (for example, potato chips or cereal). He or she will evaluate the packaging and try to determine what is necessary and what is not. If your student does not have access to a grocery store, he or she could evaluate packages found at home.

Some people advocate a fourth “R”—refusing. You may want to discuss this with your student. Many of the items we purchase are unnecessary, or there are options that have no packaging or less packaging (for example, instead of buying cookies, make your own; instead of buying items such as rice, sugar, flour, nuts, and candy in small packages, buy in bulk.)

Still others advocate a different fourth “R”—recovering. This involves recovering energy from wastes that cannot be used for something else. This fourth R is difficult to put into practice by individuals, and is geared more toward industry.

Learning Outcomes

It is expected that your student will

- compare the advantages and disadvantages of different types of packaging
- identify alternative materials that may decrease the amount of waste produced

Additional Required Materials

Activity 5: Power of a Package

- a pen or pencil
- paper or notepad

Lesson 6: Reusing

Summary

In this lesson, your student will begin to consider ways to reuse items. He or she will examine the differences between disposable and reusable products and why most reusable products are better for the environment. Your student will be given many ideas for reusing, and he or she will come away from the lesson with ideas that can be used right away. Stress to your student that sometimes caring for the environment takes a bit of prior planning, such as remembering to take his or her own bags to the grocery store, but there are many simple activities that your student can practise with his or her family.

You may want to visit the City of Edmonton’s Reuse & Reduce webpage. Choose “Reuse & Reduce” on the left-hand menu.

<http://www.edmonton.ca/waste>

This page offers information on ways to have your unwanted items reused. If you live in a small community you might want to set up a Reuse Fair as a way to practise volunteering in Module 6. You can find out about Reuse Fairs on the referenced site. You can also find out the dates of Reuse Fairs in Edmonton. There are other useful links on this page.

Learning Outcomes

It is expected that your student will

- describe alternative ways to use or dispose of waste products
- identify alternative materials that may decrease the amount of waste produced
- identify ways to reuse or recycle materials

Additional Required Materials

Activity 6: Making Wood from Paper

- a stack of old newspapers (Try to avoid coloured pages.)
- tape or cotton string

Lesson 7: Recycling

Summary

In this lesson, your student will explore recycling. Your student will discover which items are recyclable, and he or she will investigate which items can be recycled in your community. Some communities may have no comprehensive recycling program; however, beverage bottles are normally recyclable through special depots. Some grocery stores also have places to return shopping bags for recycling. The feature “A Closer Look” examines plastics. Plastics make up a large portion of our solid waste, and most are not recyclable.

In Activity 7, your student is asked to find out which items can be recycled in his or her community. Your student may need your help with this step. Phone books often list this information, or you can call the county, town, or city office for information.

Learning Outcomes

It is expected that your student will

- describe alternative ways to use or dispose of waste products
- identify ways to reuse or recycle materials
- identify methods of waste disposal in his or her community
- make a flow chart of a product from source material to disposal

Additional Required Materials

Activity 7: Making a Recycling Centre

- several cardboard boxes or other large containers
- a felt pen
- poster board (optional)

Lesson 8: Composting

Summary

In this lesson, your student will study composting. This is another way of recycling. Your student will discover what can go into a compost pile, and that to work properly, compost needs the right combination of heat, oxygen, and moisture. People who keep compost piles turn the layers of waste and soil periodically to add air, or they have a container with adequate ventilation that also keeps out animal pests. If your student is particularly keen, he or she may want to work with his or her family to set up a backyard composter. Vermiculture (composting with worms) is a practical option for apartment dwellers. The mentioned Internet website provides information on vermiculture.

Learning Outcomes

It is expected that your student will

- describe alternative ways to use or dispose of waste products
- identify wastes that are biodegradable
- identify ways to reuse or recycle materials

Additional Required Materials

Activity 8: Making a Mini-Composter

- a large, empty (waxed paper) milk carton
- a pen or large knitting needle
- a bowl or pie plate
- a stirring stick or wooden spoon
- garden soil (not potting soil)
- yard waste (grass clippings, leaves, etc.)
- kitchen waste (fruit and vegetable scraps chopped very small, coffee grounds, and tea bags)

Lesson 9: Waste in Your Community

Summary

In this lesson, your student will identify what his or her community is doing to reduce air, water, and land pollution. The activity and assignment will take up most of the lesson time for your student. In Activity 9, your student is asked to visit the landfill or transfer station in his or her community. Watch that your student does not pick up or touch garbage, as it may be dangerous. He or she will need to work with you or with another adult to organize this activity. If your student cannot visit a landfill, you may have him or her watch a garbage truck for a block or two to see the kinds of waste that go into the garbage truck. Your student could also interview a garbage collector. Since your student needs to complete a survey of waste treatment in his or her community in the assignment, he or she may need your assistance in finding the answers. Municipal or city offices are often a good place to begin.

It is also suggested that your student try to arrange a visit to the sewer treatment facility in your community to find out how grey water and sewage are treated.

Learning Outcomes

It is expected that your student will

- identify methods of waste disposal used in his or her community
- identify actions to minimize production of waste

Additional Required Materials

Activity 9: My Landfill

Note: Your student requires an adult's help and presence for this activity.

- rubber boots or other protective footwear
- a pen
- paper

Lesson 10: The Environment and You

Summary

In this lesson, your student will identify the actions that he or she can take to minimize the production of waste. Your student will revisit the Personal Action Plan to Reduce Water Usage that he or she created in Lesson 3 (Section 1 Assignment, question 3). Your student will then identify the steps that he or she can take to reduce other forms of waste.

Learning Outcomes

It is expected that your student will

- identify ways to reuse or recycle materials
- identify actions to minimize production of waste
- create, carry out, and monitor a plan to reduce waste

Additional Required Materials

Activity 10: My Plan

- Personal Action Plan to Reduce Water Usage from Lesson 3 (Section 1 Assignment, question 3)

ASSIGNMENT BOOKLET 5B

Science 4
Module 5: Section 2 Assignment

Home Instructor's Comments and Questions

Home Instructor's Signature

FOR SCHOOL USE ONLY

Assigned Teacher:

Date Assignment Received:

Grading:

Additional Information:

FOR HOME INSTRUCTOR USE (if label is missing or incorrect)

Student File Number:

Date Submitted:

Apply Module Label Here

Name

Address

Postal Code

*Please verify that preprinted label is for
correct course and module.*

Teacher's Comments

Teacher's Signature

Home Instructor: Keep this sheet when it is returned to you as a record of the student's progress.

INSTRUCTIONS FOR SUBMITTING THIS DISTANCE LEARNING ASSIGNMENT BOOKLET

When you are registered for distance learning courses, you are expected to regularly submit completed assignments for correction. Try to submit each Assignment Booklet as soon as you complete it. Do not submit more than one Assignment Booklet in one subject at the same time. Before submitting your Assignment Booklet, please check the following:

- Are all the assignments completed? If not, explain why.
- Has your work been reread to ensure accuracy in spelling and details?
- Is the booklet cover filled out and the correct module label attached?

MAILING

1. Do **not** enclose letters with your Assignment Booklets. **Send all letters in a separate envelope.**
2. Put your Assignment Booklet in an envelope and take it to the post office and have it weighed. Attach **sufficient postage** and seal the envelope.

FAXING

1. Assignment Booklets may be faxed to the school with which you are registered. Contact your teacher for the appropriate fax number.
2. All faxing costs are the responsibility of the sender.

E-MAILING

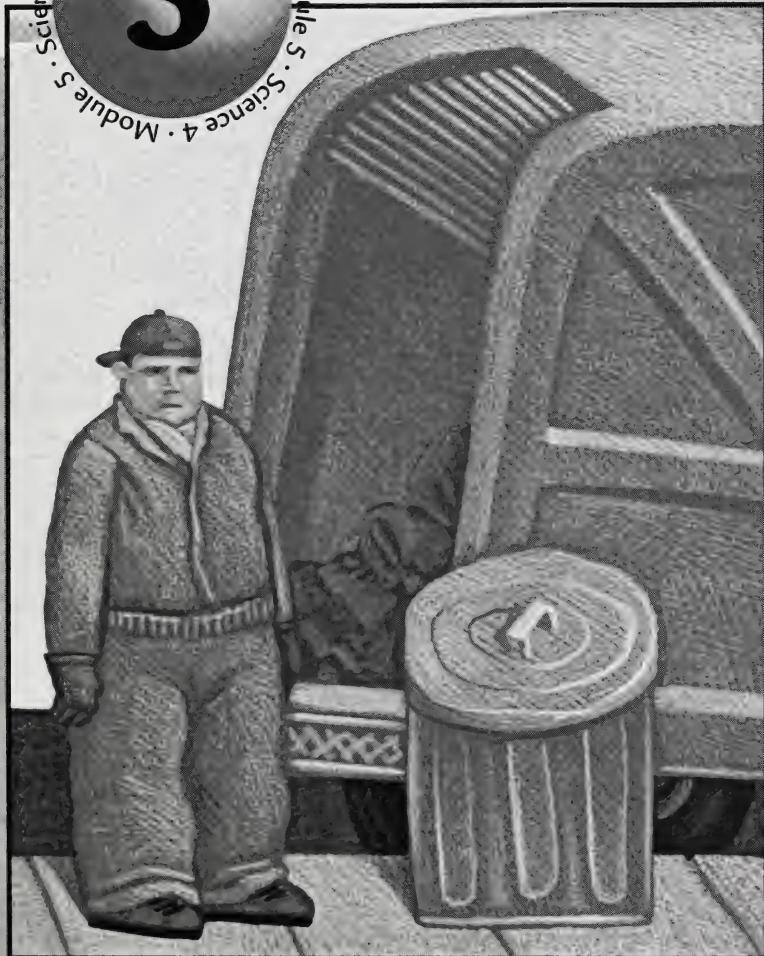
It may be possible to e-mail your completed Assignment Booklet to the school with which you are registered. You also may be **required** to e-mail some of your assignments. Contact your teacher for the appropriate e-mail address.

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Waste and Our World Assignment Booklet 5B

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Summary

	Total Possible Marks	Your Mark
Lesson 5 Assignment	15	
Lesson 6 Assignment	8	
Lesson 7 Assignment	12	
Lesson 8 Assignment	10	
Lesson 9 Assignment	15	
Lesson 10 Assignment	17	
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Teacher's Comments

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Module 5: Waste and Our World

Assignment Booklet 5B

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ASSIGNMENT BOOKLET 5B

SCIENCE 4: MODULE 5

SECTION 2 ASSIGNMENT

This Assignment Booklet is worth 77 marks out of the total 112 marks for the assignments in Module 5. The value of each assignment and each question is stated in the left margin.

Read all parts of your assignment carefully and record your answers in the appropriate places. If you have difficulty with an assignment, go back to your Student Module Booklet and review the appropriate lesson. Be sure to proofread your answers carefully before submitting your Assignment Booklet.

Note: If you are using electronic assignments, you will need to do the following:

- You need to print the pages that ask you to make a drawing. You will find them in your PDF file.
- You will need to mail your drawings to your teacher.

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Section 2 Assignment: Pollution Solutions

5. a. For one day, gather the packaging your household is going to throw away. (Remember that packaging includes bags, boxes, wrappers, tins, plastic, and glass. It is anything in which you buy a product.) List the different types of packaging that you collected.

(2) b. How did you feel when you saw how much packaging you had gathered?

(8) c. Choose one of the packages you gathered. Draw a package that will produce less waste. In sentences, explain which materials you would use in your package. Also explain why you would use these materials.

Your teacher will look for

- your awareness of the different types of packaging (5 marks)
- your reaction to the amount of packaging you collected in one day (1 mark)
- a creative new packaging design that will create less waste (5 marks)
- a neat diagram (3 marks)
- complete sentences (1 mark)



When you are ready, turn to Lesson 6 in your Student Module Booklet.

(8)

6. List two ways to reuse each of the following items.

a sheet of paper

- _____
- _____
- _____
- _____

a paper shopping bag

- _____
- _____
- _____
- _____

an old shirt

- _____
- _____
- _____
- _____

a glass jar

- _____
- _____
- _____
- _____

Your teacher will look for

- practical and creative ways to reuse each item (2 marks each)



When you are ready, turn to Lesson 7 in your Student Module Booklet.

(12)

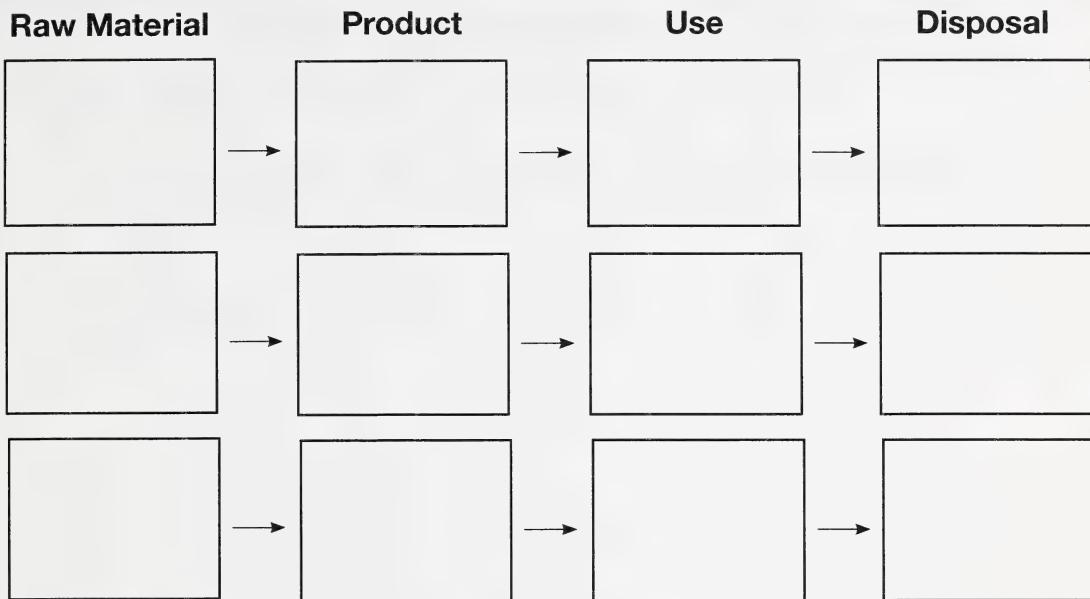
7. Use the information given in Lesson 7 to complete flow charts for 3 different items. The charts are on the next page.

Each chart should show the following:

- the raw material used in a recyclable product
- a product made from this raw material
- what this product was used for
- how this product is disposed of

Your teacher will look for

- completed charts for three different items using the information you studied in Lesson 7 (1 mark for each square)



When you are ready, turn to Lesson 8 in your Student Module Booklet.

(10)

8. Draw a design for an outdoor composter. Place your drawing on the next page. Here are questions to think about:

- How will oxygen get into the composter?
- How will you keep animal pests out of the composter?

Label your design to show how you have answered these questions.

Your teacher will look for

- a neatly drawn design for a composter (5 marks)
- printed labels that show how oxygen will get into the composter (2 marks)
- printed labels that show how you will keep out animal pests (3 marks)

My Composter Design

When you are ready, turn to Lesson 9 in your Student Module Booklet.

9. Answer the following questions about how waste is treated in your community. Use complete sentences. Are there any questions you can't answer? Say so in the answer spaces.

You may not be able to answer all of the questions. Explain how you tried to find an answer.

(6) a. Answer the following questions about **sewage treatment** in your area.

Where does grey water and sewage go in your community?

How is the waste water treated?

Where does the waste water go after it is treated?

Your teacher will look for

- complete sentences and clear answers and/or responses that show that you tried to find the answers to these questions (2 marks each)

(4)

b. Answer the following questions about **landfills** in your area.

How is garbage collected in your community? Where does it go?

Does the local landfill have rules about which items can and cannot go into the landfill? Give one example of each kind of item.

Your teacher will look for

- complete sentences and clear answers and/or responses that show that you tried to find the answers to these questions (2 marks each)

(5)

c. Answer the following questions about **recycling** in your community.

Where is your nearest recycling depot?

What kinds of materials does that depot take?

Your teacher will look for

- complete sentences (1 mark)
- clear answers and/or responses that show you tried to find the answers to these questions (2 marks each)



When you are ready, turn to Lesson 10 in your Student Module Booklet.

10. In your Lesson 3 Assignment, you made a Personal Action Plan to Reduce Water Usage. Include your Action Plan for your teacher to refer to.

a. What have you done to put your plan into action?

(7)

How well is your Personal Action Plan working?

Your teacher will look for

- a clear answer that explains what you have done to put your plan into action (4 marks)
- a clear answer that explains how well your plan is working to reduce water usage in your home (2 marks)
- complete sentences (1 mark)

(10)

b. List five actions you and your family can take to reduce other forms of waste in your home.

- _____
- _____
- _____
- _____
- _____
- _____

Your teacher will look for

- five actions that show you and your family are making an effort to reduce waste in your home (2 marks each)



Now return to your Student Module Booklet and read the Section 2 and Module conclusions and the Optional Follow-up Activities.

Home Instructor Feedback Form

Module 5: Section 2

Answer the following questions and mail them in with the completed assignment for this section.

1. Please provide some examples of how your student increased his or her understanding of waste, waste reduction, and recycling after completing this section.

2. Which activities were the most useful in helping your student understand the concepts explained in this section?

3. In Activity 9, your student was asked to visit the local landfill and, if possible, to visit the local water treatment facility. Was this a practical approach for your student?

Please add any questions or comments you may have.

Student Feedback Form

Module 5: Section 2

Answer the following questions and mail them in with the completed assignment for this section. This is not a test, and there are no marks assigned.

1. Which activity was your favourite in this section? Explain why you enjoyed this activity.

2. Will you continue with your Action Plan? Why or why not?

Checklist for Module 5: Assignment Booklet 5B

Make sure you send in all of the following items.

- Assignment Record Form
- Assignment Booklet 5B, questions 5–10
- Your Personal Action Plan to Reduce Water Usage
(Section 1 Assignment: Lesson 3, question 3)
- Home Instructor Feedback Form
- Student Feedback Form
- Optional Follow-up Activity (optional)

If you are completing your Assignment Booklet electronically, advise your teacher how you are submitting the following:

Question 5.c.

Question 7

Question 8
